

## Remarks

Upon entry into national phase in the US, Applicant amended the specifications and the claims, as well provided a clearer set of drawings and negated certain conclusions in the parent PCT application written opinion.

- 1) Applicant corrected an inadvertent mistake related to naming item 750 in Fig. 7 by amending the specifications paragraph 65 as above.
- 2) In paragraph 16, applicant perfected the reference to a US patent application as presently the issued patent.
- 3) In order to provide the Office with better quality drawings than those provided by the parent PCT application as published, applicant hereby submits a clearer copy of the drawing submitted with the PCT application.
- 4)
- 5) Applicant cancelled without prejudice claims 18-65, and maintain all rights to reclaim all matter contained therein as well as any other matter to which applicant is entitled, at a later date. Support for the claims as amended maybe found throughout the application, for example in paragraphs 1, 17, 18, and elsewhere.
- 6) Applicant submits that none of the references cited in the Written Opinion of the PCT application from which the present application claims priority discloses the feature of a single sensor providing sufficient information to measure the density of the fluid as claimed in claim 1 or to measure the viscosity of the fluid as claimed in claim 6.
- 7) The claims as amended overcome the opinion presented in the parent PCT application for the following reasons:

- 8) Claim 9 was found to lack novelty by the written opinion. Applicant points out that claim 6, the independent claim from which claim 9 depends, was found to be novel and thus claim 9 is implicitly also novel. The rest of the claims presented herein were found novel. The Office acting as ISA took the position that all of the claims have industrial applicability, but lack inventive step over Herrmann et al., (US 6,543,274) in view of Yen et al. (US 4,513,261).
- 9) Herrmann et al. specifically states that “at least two basic sensor elements” are utilized Col. 2, ll. 42-50, col. 4, ll. 23-25, Col. 6, ll. 12-18, and elsewhere throughout the Herrmann patent. A basic examination of Fig. 1 will clearly show that the two elements are simply two sensors, one with liquid traps, and the other without, each with its own set of transducers, which merely co-reside on a single quartz substrate. Thus the Herrmann reference clearly negates the claimed limitation of providing all the information for measuring the required parameters from a single sensor element.
- 10) Yen et al. is directed to a low loss acoustic filter. Yen discusses geometric and time-domain symmetry and asymmetry of the sequence of samples in two electrically co-joined transducers. The transducers are connected such that the primary time delayed signal is additively combined whereas the multiply reflected “triple transit” signals are destructively combined. Yen describes a reflection-free delay line (transversal) filter, which is the antithesis of a resonator filter. The present invention employs two distinct resonant structures whereas Yen aims to eliminate all possible resonances (Col. 5, ll. 5-21). The present invention seeks two well defined coupled resonances in the frequency domain and an infinite impulse response in the time domain whereas Yen seeks no frequency domain resonances and, as stated above, seeks the cancellation of all time domain signal beyond the intended finite impulse response. Most importantly, it is crucial to understand that Yen does NOT provide a 180 degrees TRANSFER FUNCTION. A transfer function is a function as compared between the input and the output of a device. Within the Yen device there are waves that are at 180 degrees from each other, and therefore their combine

destructively. However there is no 180 phase shift transfer function in the Yen device.

- 11) Thus the Yen patent teaches away from the present invention, and the Herrmann patent teaches away from the present invention. Therefore, the skilled artisan would not be motivated to combine the Yen patent with the Herman patent, but on the contrary driven away from such combination. Furthermore, such a combination could not result in a device through which one could practice the present invention, as the present invention utilizes a device with two resonances. Herrmann employs at least two individual sensor elements and Yen eliminates resonances, the proposed combination results in a device with multiple sensor elements having no resonances.
- 12) Furthermore, the Herman patent is directed to the use of two distinct and uncoupled acoustic wave devices to obtain sufficient information for measurement of the desired parameter. The explicit use of two sensors in the Herrmann reference clearly teaches away from the present invention. Similarly, the Yen patent is specifically directed to a THREE TRANSDUCER filter (Col. 4, ll. 44-50) attempting to achieve a condition of NO RESONANCES, coupled or uncoupled. The device disclosed in the present invention seeks a 180 degree transmission phase between input and output at a resonant frequency. The Yen device seeks a differential path length of 180 degree shift in order to internally cancel an undesired resonance. While the present invention may utilize some number of electrodes between the claimed input and output transducers, they are not required for its operation. Thus the Yen patent relates to a completely different device type, which operates in a completely different way.
- 13) As shown above, the Herrmann patent also relates to a completely different mode of operation both from the present invention and the Yen reference. Therefore the modification of either Yen or Herrmann to operate in accordance with the present invention will negate their method of operation, their disclosed mode of operation

and in the case of Yen impermissibly would make the device unsatisfactory for its intended use (see MPEP 2143.01). Therefore the proposed modification represents change in the principle of operation of both the Yen and the Herrmann patents, as well as rendering one of the references unsatisfactory for its intended use, and each of those factors, separately or in combination, would make the combination of the two patents impermissible.

- 14) Moreover, neither Herrmann nor Yen discloses the claimed limitation requiring sufficient coupling between the input and output resonant structures to provide the claimed transfer function, and thus a claimed element is not disclosed by either references. Herrmann does not disclose any such coupling, and neither does Yen which derives a completely different transfer function. Thus both references alone or in combination fail to disclose all the claimed limitations as required.
- 15) Further, In the case of Herrmann each of the resonator structures is a unique and separate sensor element. One skilled in the art will recognize that such coupling would be troublesome within the proposed instrumentation, and the added cost of manufacture stemming from having two separate sensor elements. In the case of Yen the left and right transducers are directly connected and employed as two halves of a single transducer. Even if, arguendo, one was to accept the internal destructive wave cancellation within the Yen device as a 180 degrees phase shift or transfer function, one will need to apply similar structure to the present invention to obtain such result. However applying Yens' teachings to the present invention utilizing the operational mode disclosed by Yen, would be analogous to electrically connecting the two transducers to obtain a single pole, single port resonator, thus impermissibly destroying the operation of the present inventions' device.
- 16) The mere fact that references CAN be combined or modified does not render the resultant combination obvious UNLESS the prior art also suggests the desirability of the combination (See In re Mills, 916 F.2d 680, Fed Cir. 1990). The Herrmann

references utilizes a different method for achieving the goal of measuring viscosity and/or density necessitating the use of at least two sensor elements to perform this function. There is no suggestion or motivation to modify the reference to obtain the same results with a single sensor, as such would have destroyed the mere reason for the second sensor element in the Herrmann patent, as well as would radically change its mode of operation.

- 17) Applicant has clearly shown that the combination of the Herrmann and Yen patents are impermissible as no motivation is provided to combine the references, as the result would not have been expected by the skilled in the art lacking the teaching of the present invention, for failing to teach all claims limitations, for rendering at least the Yen device unsatisfactory for its intended purpose, for teaching away from the claimed invention, for the fact modifying the present invention as proposed by Yen by connecting the input and output transducers would render it inoperable, and for the fact that modifying each of the patents referenced would substantially modify their principle of operation. For all the reasons stated above, applicant submits that the claims as submitted upon national stage entry are allowable over the references cited in the PCT written opinion.
- 18) Applicant further protests in the strongest terms allowed, the complete failure of the Office to meet its obligations under the PCT treaty, when operating as the International Search Authority in the PCT application from which the present application claims priority. On March 25, 2005, while acting in this capacity the Office mailed to applicant an invitation to pay additional fees, which claimed that the application lacked unity of invention. On April 7, 2005 Applicant submitted to the Office the required fee under protest, with detailed explanation clearly showing that the Office inappropriately applied the wrong standard to the lack of unity opinion. The Office never responded to the protest, despite multiple telephonic requests, and no further explanation or response to the arguments presented was provided in the written opinion or in any other communication thereafter, causing

significant damage to applicant's international position. Applicant respectfully demands that the Office will either show why the finding of lack of unity was proper, or that the Office will recognize on record that the finding of lack of unity of invention was in error.

Applicant respectfully requests that the above amendment be entered into record and that the application be examined in accordance therewith.

Respectfully submitted

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